Installation of Ultrasonic
Flow Sensor on Narkomed 2C

INSTALLATION PROCEDURE

The following procedure is divided into four parts: Replacing the volume sensor interface panel to accommodate the new ultrasonic flow sensor connector, downloading new software to the machine, selecting the ultrasonic flow sensor function, and installing the new flow sensor on the absorber assembly.

**Installing the new sensor interface panel:**

1. Turn the System Power switch to STANDBY and remove AC power from the machine.

2. Disable the battery circuit breaker by pulling out its button with a knife or sharp object.

3. Disconnect the Spiromed sensor cord from its interface panel on the machine.

4. Loosen the screws securing the top cover of the machine. Raise the cover, disconnect the ground wire and set the cover aside.

CAUTION: The processor board contains static sensitive devices. Use ESD protection when handling the processor assembly.

5. Disconnect the Spiromed sensor interface cable from J17 on the processor PCB assembly. See Figure 1.

6. At the back of the machine, remove the cover from the wiring channel and interface housing. See Figure 2.

7. Disconnect the ground wire and remove the existing volume sensor interface panel assembly (including the cable) from the interface housing and wiring channel.

8. Take the new volume sensor interface panel assembly and feed the connector end of the cable up through the back of the interface housing and wiring channel up into the ventilator box. See Figure 3.

   Continue feeding in the cable until the new volume sensor interface panel can be positioned in the interface housing opening.

9. Install the new interface panel in the housing with the hardware that previously retained the original sensor interface panel.

10. Install the ground wire from the new interface panel in the same manner as the original (see Figure 3) and tighten the ground lug retaining nut.

11. Reinstall the wiring channel cover.

12. Join the connector end of the new interface cable to J17 on the processor assembly (ref. Figure 1).

NOTE: the single flying lead attached to this connector will be joined to the power supply wire harness in the next step.

1

INSTALLATION PROCEDURE (continued)
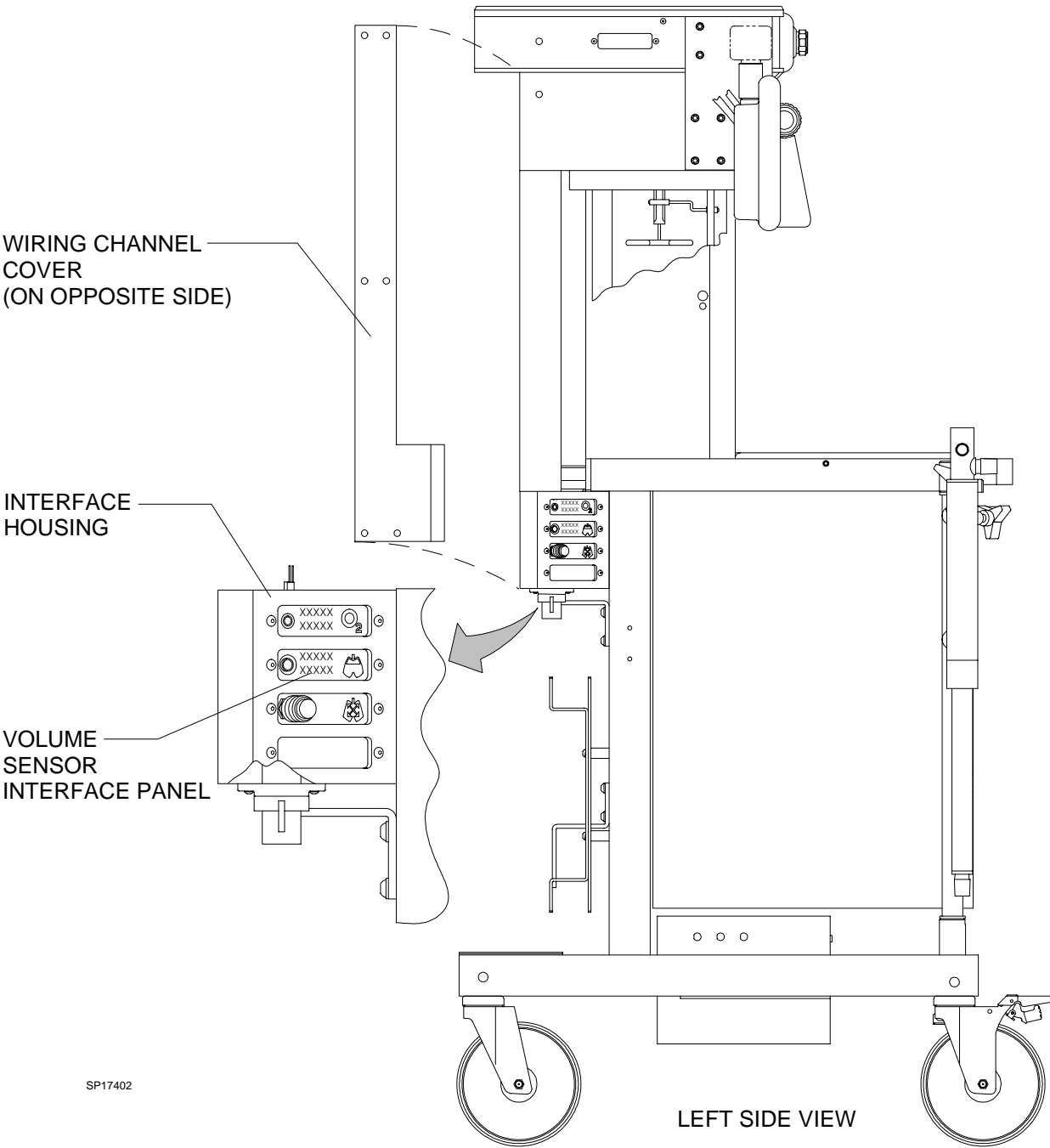
VENTILATOR BOX TOP VIEW
WITH COVER REMOVED
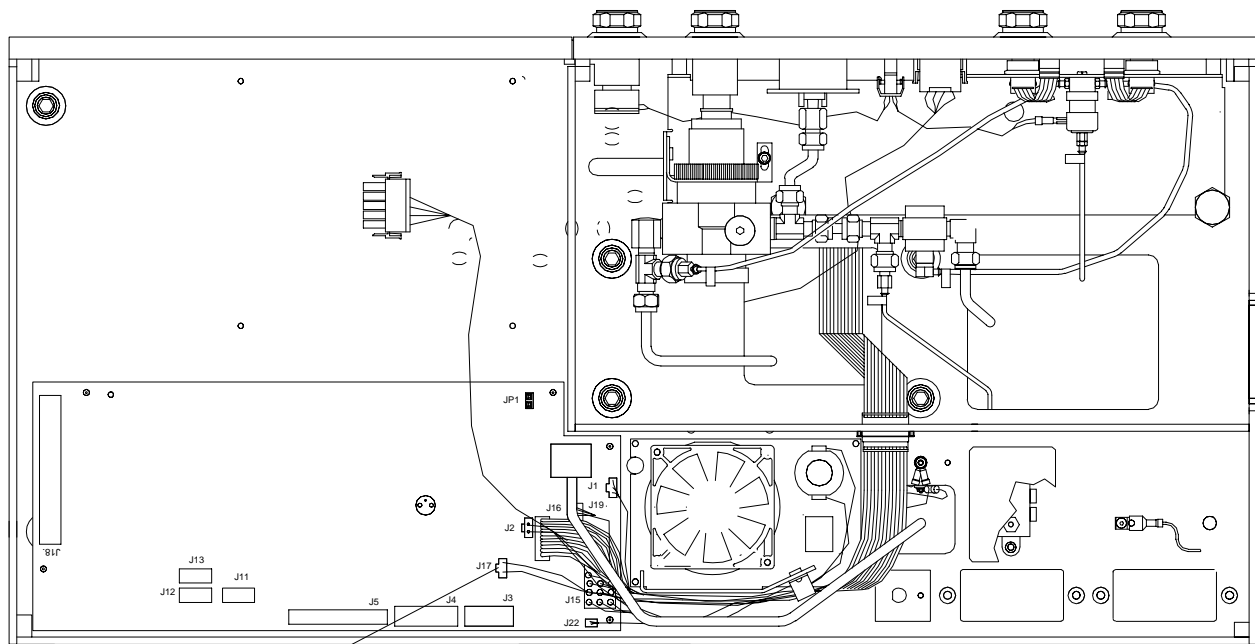
SP17401

JI7
SPIROMED SENSOR INTERFACE
CABLE CONNECTION

Figure 1. Spiromed Interface Cable Connection

2

INSTALLATION PROCEDURE (continued)

WIRING CHANNEL
COVER
(ON OPPOSITE SIDE)

INTERFACE
HOUSING

VOLUME
SENSOR
INTERFACE PANEL

SP17402

LEFT SIDE VIEW

Figure 2. Interface Housing and Wiring Channel Arrangement

3

INSTALLATION PROCEDURE (continued)

VENTILATOR BOX

WIRING CHANNEL

GROUND LUG
RETAINING NUT

GROUND WIRE
(INSTALL UNDER
GROUND LUG
RETAINING NUT
W/LOCK WASHER)

CABLE (ROUTE UP THROUGH
WIRING CHANNEL AND
INTO VENTILATOR BOX)

VOLUME SENSOR INTERFACE
PANEL ASSEMBLY
(INCLUDES CABLE AND GROUND WIRE)
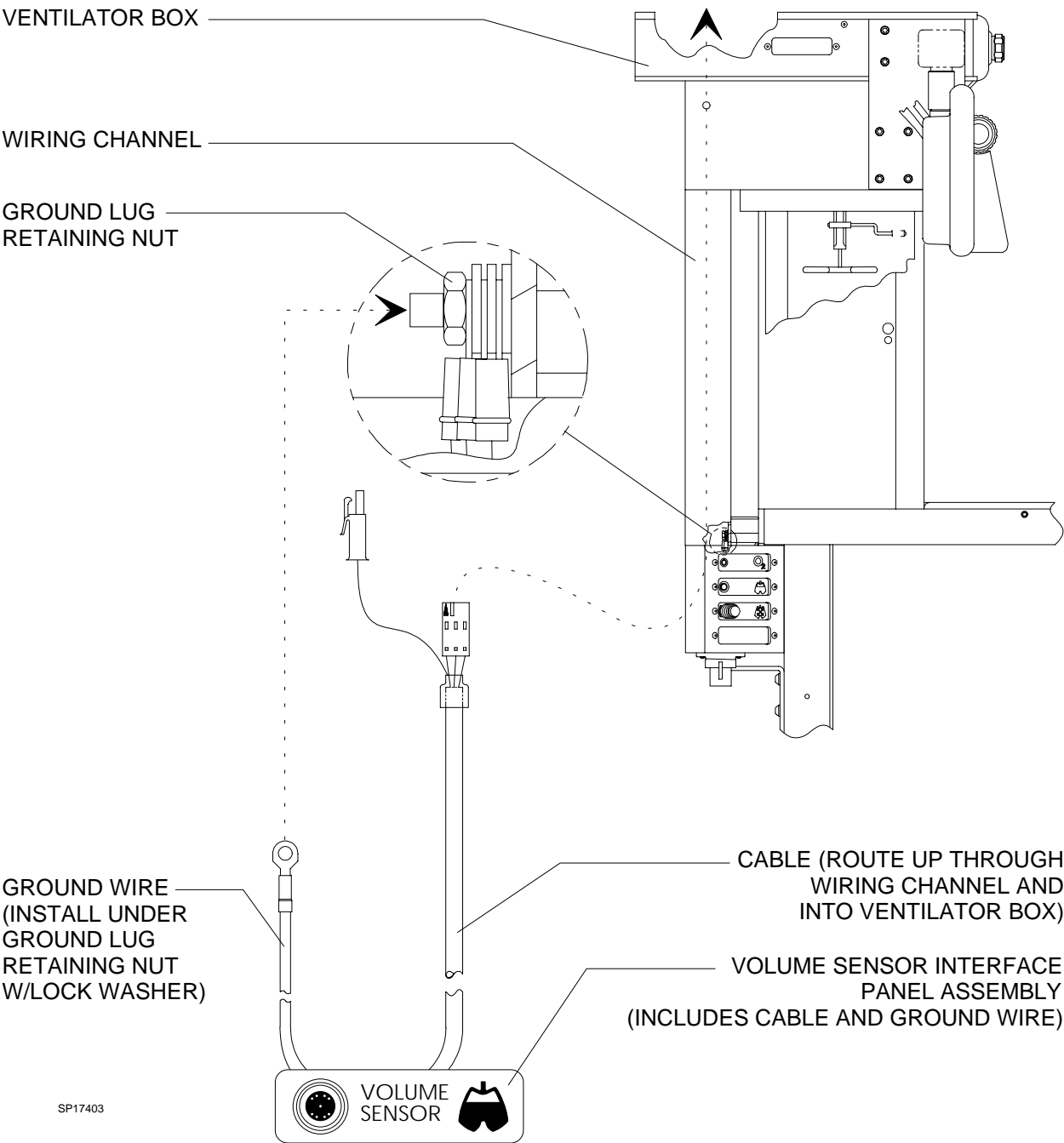
SP17403

VOLUME
SENSOR

Figure 3. Volume Sensor Interface Cable Installation

4

INSTALLATION PROCEDURE (continued)

13. Disconnect the power supply wire harness from J15 on the processor board. Install the pin end of the new flying lead assembly into the unused hole location for Pin #1 on the connector. See Figure 4. Press the pin into the connector until it locks in place.

    Reconnect the wire harness to J15 on the processor board. Join the flying lead from this assembly to the flying lead attached to the sensor interface connector at J17 on the processor board.

14. Reconnect the top cover ground wire and reinstall the top cover on the machine.

15. Reconnect all interface cables except the Volume sensor cable.

16. Enable the battery circuit breaker and restore power to the machine.
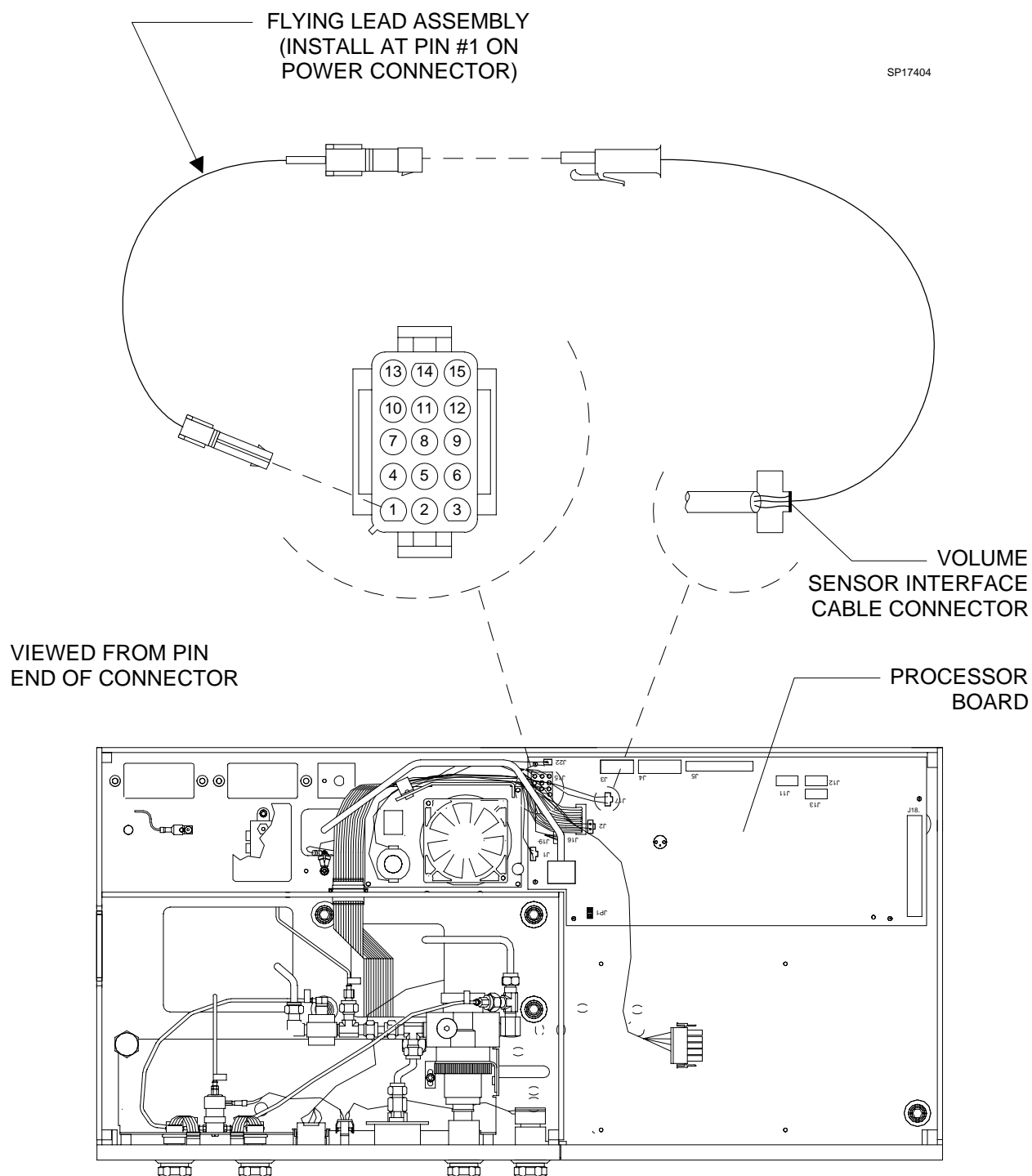
INSTALLATION PROCEDURE (continued)

FLYING LEAD ASSEMBLY
(INSTALL AT PIN #1 ON
POWER CONNECTOR)

SP17404

VOLUME
SENSOR INTERFACE
CABLE CONNECTOR

VIEWED FROM PIN
END OF CONNECTOR

PROCESSOR
BOARD

Figure 4. Power Connection - Flying Lead Installation

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INSTALLATION PROCEDURE (continued)

Software Installation:

NOTE: If your machine has software version 1.41 or later, skip this section and proceed to Enable the Ultrasonic Flow Sensor.
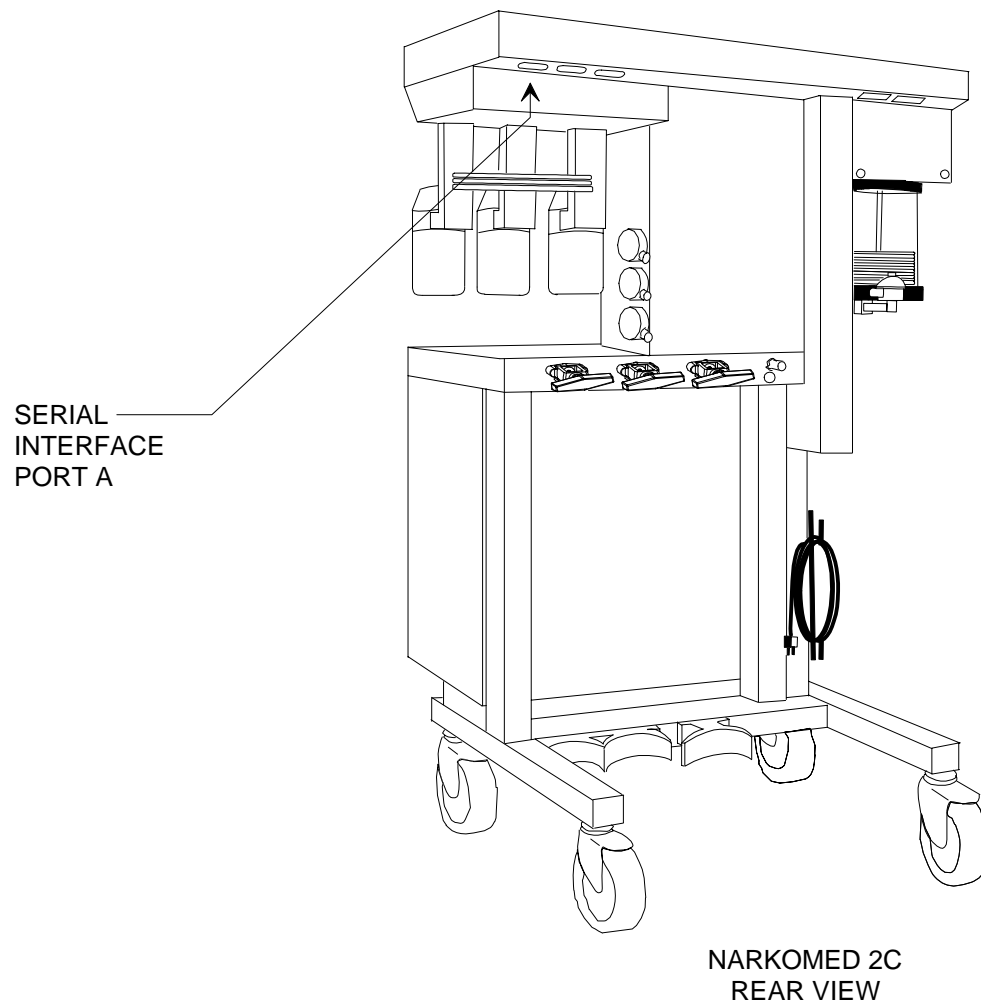
The software update is done through a serial port connection on the machine to an external PC using the batch file LOADNM2C.BAT and containing Narkomed 2C software version 1.41 or later.

1. Turn the System Power switch to STANDBY.

2. Connect an interface cable (9-pin or 25-pin) to COM 1 on the PC, and connect the other end of the cable to the Narkomed 2C serial interface Port A as shown in Figure 5.

3. Press and hold the SILENCE and AUTOSET keys on the remote display, and turn the System Power switch to ON. Release the keys when the load mode screen shown in Figure 6 appears.

4. Power up the PC. At the DOS prompt, set the PC to read the drive holding the software. For example: if the software was downloaded to drive A, type A: and press ENTER.

5. Type LOADNM2C and press ENTER.

   Software installation is complete when the machine resets.

6. Turn the System Power switch to STANDBY, turn the PC OFF and disconnect the interface cable.

Ultrasonic Flow Sensor Selection:

1. Turn the system Power switch to ON.

2. Access the secondary service screen (contact North American Dräger technical service department for access instructions if necessary) and enable the ultrasonic flow sensor as follows:
   • Turn the Datagrip thumbwheel to highlight ULTRASONIC FLOWSENSOR on the remote display.
   • Press the trigger to toggle the function ON.

3. Turn the System Power switch to STANDBY, and then return it to ON - in order to retain the selection.

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INSTALLATION PROCEDURE (continued)

SERIAL
INTERFACE
PORT A

SP17405

NARKOMED 2C
REAR VIEW

Figure 5. Serial Interface Port Location

INSTALLATION PROCEDURE (continued)

SYSTEM STARTUP

NARKOMED 2C BOOT
COPYRIGHT (C) 1994, NAD INC.
VERSION: X.XX
SOFTWARE ID: XXXX

NM2C SOFTWARE LOADER

LOADING IMAGE

VERSION X.XX NM2C SW
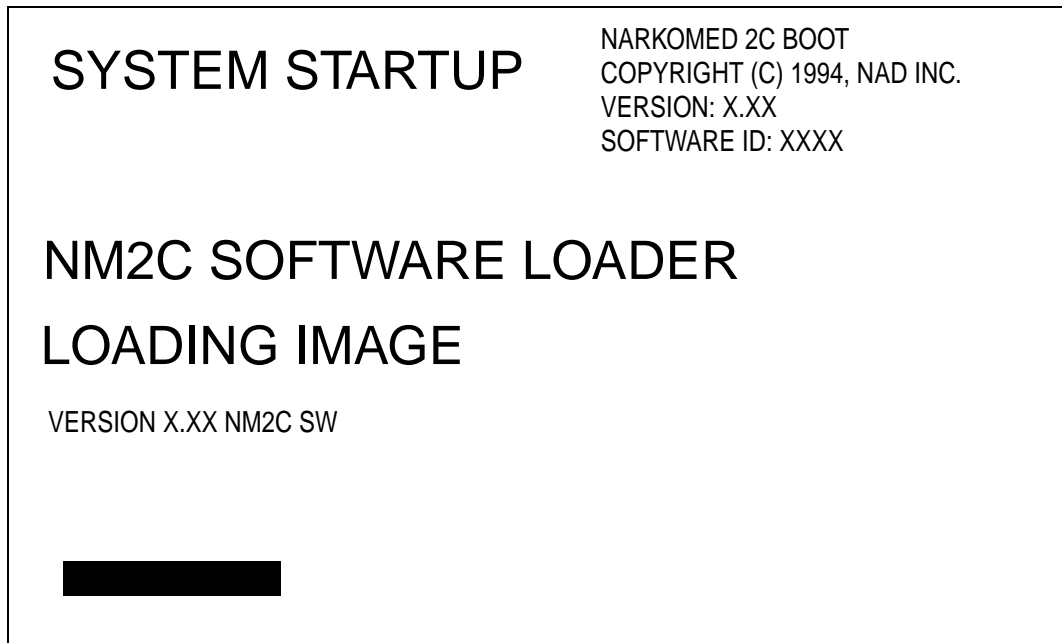
Figure 6. Narkomed 2C Load Mode Screen

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INSTALLATION PROCEDURE (continued)

Ultrasonic Flow Sensor Installation:

1. Remove the existing Spiromed sensor from the absorber assembly by unscrewing its retaining nut.

CAUTION: Do not twist the body of the sensor when loosening the retaining nut. Hold the sensor while loosening the retaining nut to prevent damage to the unit.

2. Install the new flow sensor bracket and clamp on the expiratory valve mount neck, below the threads as shown in Figures 7 and 8.

CAUTION: In order to avoid interference between the connector hose and the bellows assembly, the flow sensor bracket must be oriented as shown in Figure 7.

3. Reinstall the expiratory valve (be sure a gasket is in place), oriented as shown in the illustration.

4. Slide the ultrasonic flow sensor down onto the bracket.

5. Install the connector hose on the threaded port of the flow sensor, and join the other end of the hose to the expiratory valve.

6. Connect the sensor plug to the new volume sensor receptacle on the interface housing
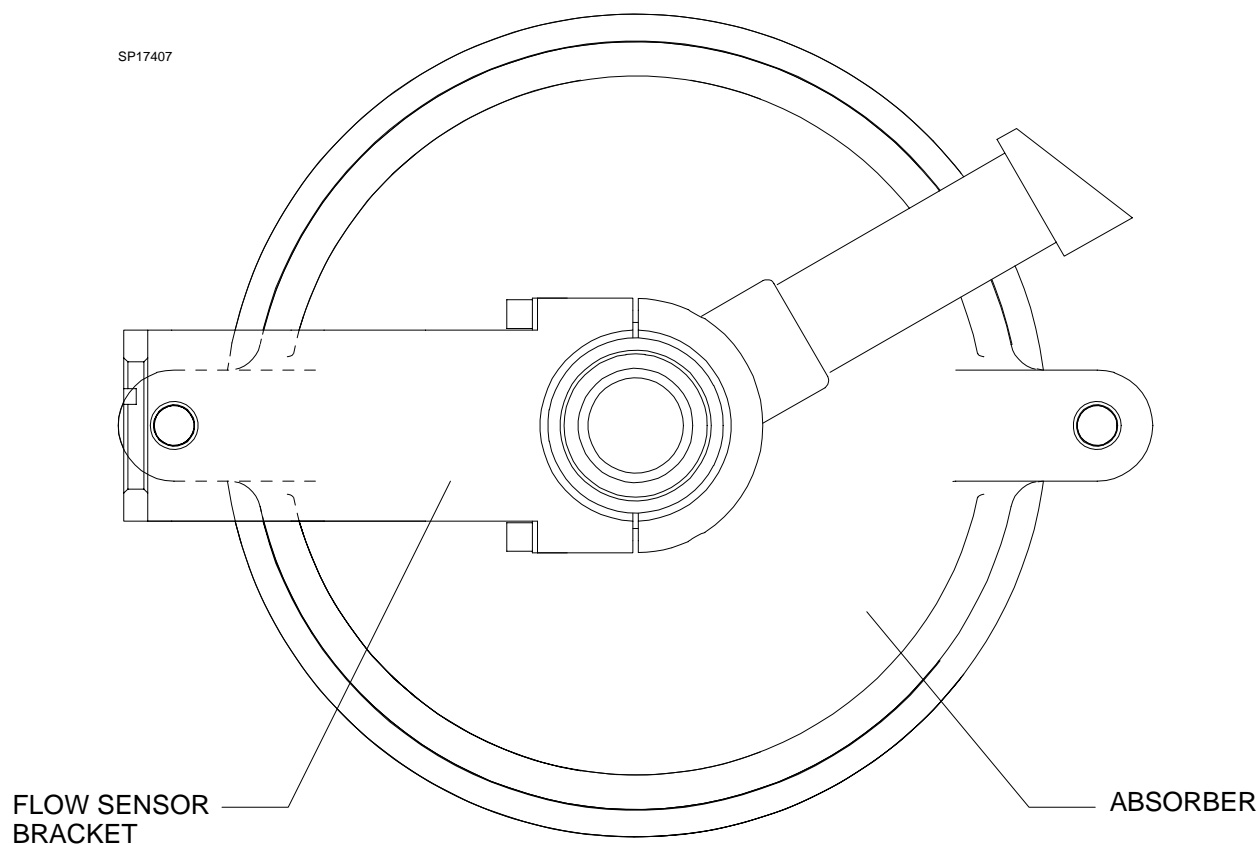
7. Perform a PMS procedure on the system.

SP17407

FLOW SENSOR
BRACKET

ABSORBER

Figure 7. Flow Sensor Bracket Orientation: Top View

10

INSTALLATION PROCEDURE (continued)
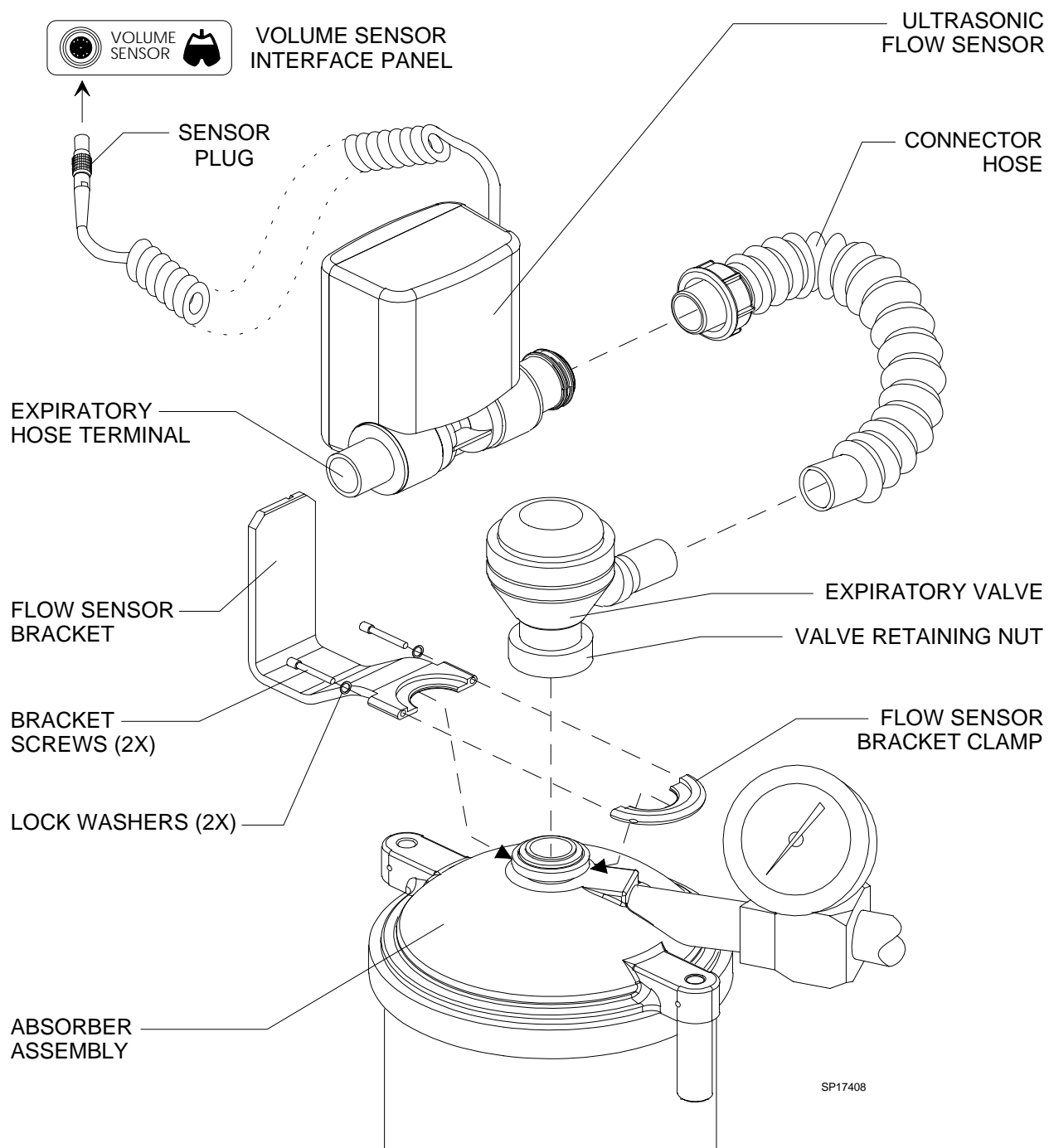

Figure 8. Ultrasonic Flow Sensor Installation

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North American Dräger

Quality Service for Life®

DrägerService^{SM}
3122 Commerce Drive
Telford, PA 18969
(215) 721-5402
(800) 543-5047
(215) 723-5935 Fax

Part Number: SP00174

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